Meteorological Conditions During Solar Observations, Blue Hill Meteorological Observatory, June 1937

Date	Time from local noon	Temperature °C	Wind Beaufort	Visibility	Sky blue	Haze[1]	Cloudiness and remarks
June 4	0:32 a. m.	20.0	WSW 3	7	8	1	6 Cu.
7	0:19 a. m.	22.8	ENE 3	6	7	2	8 Cu.
7	1:28 p. m.	23.1	NE 2	6	7	2	3 Cu.
7	2:43 p. m.	24.4	NE 2	6	7	2	1 Ac, 1 Cunb.
9	5:05 a. m.	16.7	SW 4	8	8	0	Zero clouds.
9[2]	2:07 a. m.	22.8	SW 3	7	8	1	Zero clouds.
9	1:45 a. m.	22.8	SW 3	7	8	1	Zero clouds.
9[2]	0:26 a. m.	25.0	SSW 3	7	8	1	Few Cu.
9	0:04 a. m.	25.6	SSW 3	7	8	1	Few Ci., 1 Cu.
12	3:49 a. m.	18.9	NW 2	7	8	0	Few Cu.
12	1:41 a. m.	22.5	SW 2	8	8	0	Few Ci., Few Cu.
12	2:49 p. m.	24.4	SW 3	8	8	0	4 Cu.
13	4:37 a. m.	17.8	W 4	8	8	0	Few Ci.
13[2]	3:13 a. m.	21.0	W 3	8	8	0	Few Ci.
13	3:01 a. m.	21.0	W 3	8	8	0	Few Ci.
13	0:24 a. m.	23.2	W 5	8	8	0	Few Ci., Few Cu.
13	3:54 p. m.	25.7	WSW 3	9	8	------	Few Cu.
15	3:52 a. m.	20.3	NW 3	8	8	0	Few Cu.
15	0:29 p.m.	23.1	NNE 2	8	8	1	4 Cu.
16	3:53 a. m.	18.4	ENE 3	9	8	1	Few Ci.
16	1:52 a. m.	20.3	E 3	9	8	0	Few Ci.
16[2]	1:45 a. m.	20.4	E 3	9	8	0	Few Ci.
16	1:07 p. m.	23.2	E 2	9	8	0	2 Ci.
17	0:44 a. m.	21.7	E 2	8	8	1	2 Ci.
17	1:10 p. m.	22.8	SE 2	8	8	1	1 Ci., Few Cu.
23	4:14 p. m.	21.2	SE 1	9	8	0	8 Ci., Few Ac., Few Cu.
24	4:26 a. m.	18.9	NNE 2	6	7	2	Few Ci.
24[2]	3:21 a. m.	21.0	N 2	6	7	2	Few Ci.
24	2:58 a. m.	21.1	NE 3	6	7	2	Few Ci.
24	0:24 p. m.	21.9	NE 3	9	7	0	Few Ci., Few Cu.
24	2:28 p. m.	21.9	NE 3	9	7	0	Few Ci., Few Cu.
24	4:23 p. m.	21.7	NE 3	9	7	0	Few Ci., Few Cu.
29	3:55 p. m.	19.3	NE 3	4	8	0	2 Ci., Few Cu.

[1] Haze—0 Light; 1 Moderate; 2 Dense.
[2] Indicates Smithsonian Observation.

AREAS OF SUNSPOTS MEASURED AT MOUNT WILSON OBSERVATORY

By SETH B. NICHOLSON

[Mount Wilson Observatory, Carnegie Institution of Washington, July 1937]

The areas and positions of sun spots have been published monthly since January 1927 by the U. S. Naval Observatory in the MONTHLY WEATHER REVIEW. The Mount Wilson Observatory of the Carnegie Institution of Washington has cooperated in this program by measuring on the sketches made at the 150-foot tower telescope[1] the areas and positions of sunspots on the days requested by the Naval Observatory. It was early recognized that a large systematic difference existed between the areas so determined and those measured by the Greenwich Observatory, and in 1927 it was found that the areas given in the MONTHLY WEATHER REVIEW had to be increased by 41 percent to eliminate the systematic differences between them and the Greenwich measures.[2] The areas obtained at the Mount Wilson Observatory were apparently in close agreement with those from the Naval Observatory, although very different methods and equipment were used at the two observatories.

The publication of a note in the MONTHLY WEATHER REVIEW for February 1937 to the effect that the areas obtained at the Naval Observatory prior to 1937 should be multiplied by a factor of 1.5708 lead to an investigation of the large systematic differences between the areas determined from visual observations and those obtained from photographs.

Our drawings of sunspots have been made by several different observers, and with one exception all have drawn the spots consistently smaller than shown on photographs; no significant systematic errors were made in their measurement. Areas measured from photographs taken at Mount Wilson agree very closely with those measured at Greenwich, and photographs made with both yellow and blue light give essentially the same areas.

[1] MONTHLY WEATHER REVIEW, *55*, 85, 1927.
[2] Publications of the Astronomical Society of the Pacific, *41*, 277, 1929.

TABLE 1

Year	G./Mt.W.	Weight	G./N.	Weight
1927	1.33	6	0.88	47
1928	1.28	10	.86	71
1929	1.37	9	.88	61
1930	1.47	4	.91	16
1931	1.20	3	1.02	13
1932	1.09	1	.77	8
1933	1.29	1	.87	4
1934	1.19	1	1.18	5
Mean	1.31	----------	.89	----------

The mean factors by which the areas measured on the Mount Wilson drawings have to be multiplied to reduce them to the areas measured on photographs at Greenwich are given for each year in the second column of table 1. The factor to reduce the corrected Naval Observatory measures to the Greenwich scale are in the fourth column. The factor necessary to reduce the Mount Wilson areas to those of the Naval Observatory could not be determined directly, since measurements were made at Mount Wilson only on days for which photographs were lacking at the Naval Observatory. A comparison of both Naval and Mount Wilson Observatories with the Greenwich Observatory indicates that the Mount Wilson areas as published should be multiplied by 0.94 to reduce them to the published areas from the Naval Observatory prior to January 1937 and by 1.48 to reduce them to the corrected areas from the Naval Observatory. The weights in table 1 are proportional to the total areas.

The reason for such a large systematic difference between drawings and photographs probably lies in the fact that the contrast between photosphere and penumbra is reduced on the sketches and increased on the photographs.

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy (Ret.), Superintendent, U. S. Naval Observatory. Data furnished by the U. S. Naval Observatory in cooperation with Harvard and Mount Wilson Observatories. The difference in longitude is measured from the central meridian positive west. The north latitude is positive. Areas are corrected for foreshortening and are expressed in millionths of the sun's visible hemisphere. The total area for each day includes spots and groups]

Date	Eastern standard time	Heliographic			Area		Total area for each day	Observatory
		Diff. in longitude	Longitude	Latitude	Spot	Group		
1937	h. m.	°	°	°				
June 1	11 46	−42.0	349.2	+12.0	-------	776	---------	U. S. Naval.
		+2.0	33.2	−17.0	-------	6	---------	
		+23.0	54.2	+17.0	-------	388	---------	
		+28.0	59.2	+11.0	-------	145	---------	
		+73.0	104.2	+11.0	-------	582	---------	
		+75.0	106.2	+12.0	-------	145	---------	
		+86.0	117.2	−20.0	388	---------	2,430	
June 2	10 57	−82.0	296.4	+10.5	-------	242	---------	Do.
		−69.0	309.4	+9.0	-------	24	---------	
		−29.0	349.4	+12.5	-------	921	---------	
		+12.5	30.9	−18.0	-------	48	---------	
		+36.0	54.4	+17.5	-------	242	---------	
		+41.0	59.4	+13.0	-------	242	1,719	
June 3	14 43	−83.0	280.1	−17.0	194	---------	---------	Do.
		−78.0	285.1	+10.5	-------	242	---------	
		−69.0	294.1	+10.5	-------	339	---------	
		−32.0	331.1	+10.0	-------	24	---------	
		−15.0	348.1	+13.0	-------	1,067	---------	
		+29.0	32.1	−17.0	-------	48	---------	
		+49.5	52.6	+17.5	-------	97	---------	
		+57.0	60.1	+14.5	-------	218	2,229	
June 4	11 5	−70.0	281.9	−16.0	194	---------	---------	Do.
		−64.0	287.9	+11.0	-------	242	---------	
		−56.0	295.9	+11.0	-------	388	---------	
		−40.0	311.9	+10.5	-------	73	---------	
		−11.0	340.9	+9.0	-------	12	---------	
		−2.0	349.9	+13.0	-------	1,067	---------	
		+11.0	2.9	−32.0	-------	24	---------	
		+16.0	7.9	+6.0	-------	12	---------	
		†+40.0	31.9	−17.0	-------	36	---------	
		+65.0	56.9	+17.0	-------	48	---------	
		+74.0	65.9	+14.5	194	---------	2,290	